ESI

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March 2, 2011

Mr. Peter Nyberg
United Water
Hull Wastewater Treatment Facility
1111 Nantasket Avenue
Hull, Massachusetts 02045

Dear Mr. Nyberg:

Enclosed, please find a copy of our report presenting the results of a toxicity test completed using an effluent sample collected from the Hull, Massachusetts Wastewater Treatment Facility during the February 2011 sampling period. Acute toxicity was evaluated using the inland silverside, *Menidia beryllina*.

Please do not hesitate to call me, Kirk Cram or Petra Karbe should you have any questions regarding the report.

Sincerely,

EnviroSystems, Incorporated

Kenneth A. Simon
President

Enclosure
WET Test Report Certification
Report Number 20676-11-02
One (1) copy (email only)

WHOLE EFFLUENT TOXICITY TEST REPORT CERTIFICATION

Permittee Certification

I certify under penalty of law that this document and all ATTACHMENTS were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Executed on:_____
Date

_____
Authorized Signature

_____
Print or Type Name and Title

_____
Print or Type the Permittee's Name

_____
Print or Type the NPDES Permit No.

Laboratory Certification

I certify under penalty of law that this document and all ATTACHMENTS were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Executed on: 3/2/11
Date

Kenneth A Simon
Authorized Signature

Kenneth A. Simon
President - EnviroSystems, Incorporated

TOXICOLOGICAL EVALUATION
OF A TREATED MUNICIPAL EFFLUENT
BIOMONITORING SUPPORT FOR A NPDES PERMIT:
February 2011

Hull Wastewater Treatment Facility
Hull, Massachusetts
NPDES Permit Number MA0101231

Prepared For

United Water
Hull Wastewater Treatment Facility
1111 Nantasket Avenue
Hull, Massachusetts 02045

By

EnviroSystems, Incorporated
One Lafayette Road
Hampton, New Hampshire 03842

February 2011
Reference Number Hull 20676-11-02

STUDY NUMBER 20676

EXECUTIVE SUMMARY

The following summarizes the results of an acute exposure bioassay completed during February 2011 in support of the NPDES biomonitoring requirements of the Hull, Massachusetts Wastewater Treatment Facility, operated by United Water. The 48 hour acute definitive assay was completed using the inland silverside, *Menidia beryllina*.

M. beryllina were 9 days old at the start of the test. Dilution water was receiving water collected from Massachusetts Bay at a point away from the discharge.

Samples were received under chain of custody in good order. All sample receipt, test conditions and control endpoints were within protocol specifications except where otherwise noted. The results presented in this report relate only to the samples described on the chain(s) of custody and sample receipt log(s).

Results from the acute exposure assay and their relationship to permit limits are summarized in the following matrix.

Acute Toxicity Evaluation

Species	Exposure	LC-50	A-NOEC	Permit Limit (LC-50)	Effluent Meets Permit Limit	Assay Meets Protocol Limits
Menidia beryllina	48 Hours	>100%	100%	≥100%	Yes	Yes

TOXICOLOGICAL EVALUATION OF A TREATED MUNICIPAL EFFLUENT BIOMONITORING SUPPORT FOR A NPDES PERMIT: February 2011

Hull Wastewater Treatment Facility
Hull, Massachusetts
NPDES Permit Number MA0101231

1.0 INTRODUCTION

This report presents the results of an acute toxicity test completed on a composite effluent sample collected from the Hull, Massachusetts Wastewater Treatment Facility (Hull WWTF), operated by United Water. Testing was based on programs and protocols developed by the US EPA (2002) and involved conducting a 48 hour static acute toxicity test with the inland silverside, *Menidia beryllina*. Testing was performed at EnviroSystems, Incorporated (ESI), Hampton, New Hampshire in accordance with the provisions of the NELAC Standards (2000).

Acute toxicity tests involve preparing a series of concentrations by diluting effluent with control water. Groups of test animals are exposed to each effluent concentration and a control for a specified period. In acute tests, mortality data for each concentration are used to calculate (by regression) the median lethal concentration, or LC-50, defined as the effluent concentration which kills half of the test animals. Samples with high LC-50 values are less likely to cause significant environmental impacts. The no-effect concentration is also determined to provide information about the level of effluent which would have minimal acute effects in the environment. This Acute No Observed Effect Concentration (A-NOEC) is defined as the highest tested effluent concentration which causes no significant mortality.

2.0 MATERIALS AND METHODS

2.1 General Methods

Toxicological and analytical protocols used in this program follow procedures primarily designed by the EPA to provide standard approaches for the evaluation of toxicological effects of discharges on aquatic organisms, and for the analysis of water samples. See Section 4.0 for a list of references.

2.2 Test Species

When necessary, *M. beryllina* were acclimated to approximate test conditions prior to use in the assay. Test organisms were transferred to test chambers using a large bore glass pipet, minimizing the amount of water added to test solutions. Twenty control fish were weighed during the test to confirm loading rates. The loading rate was above the maximum 0.4 g/L loading rate recommended for assays conducted at 25°C. Fish weights and loading calculations are included in the data appendix.

2.3 Effluent, Receiving Water and Laboratory Water

Effluent and receiving water collection information is provided in Table 1. Samples were stored at 4°C and warmed to 25±1°C prior to preparing test solutions. Effluent used in the *M. beryllina* assay was salinity adjusted to 25±2 ppt using artificial sea salts according to protocol (EPA 2002). Laboratory water was collected from the Hampton/Seabrook Estuary. This water is classified as SA-1 and has been used to culture marine test organisms since 1981.

Total residual chlorine (TRC) was measured by amperometric titration (MDL 0.02 mg/L) in both the effluent and diluent samples. If chlorine was present in the sample, the sample was dechlorinated using sodium thiosulfate and a control assay using laboratory water treated with an equal amount of sodium thiosulfate was run concurrently. Data for the sodium thiosulfate laboratory control can be found in Appendix A.

2.4 Acute Toxicity Test

The 48 hour static acute toxicity test was conducted at 25±1°C with a photoperiod of 16:8 hours light:dark. Test chambers were 250 mL glass beakers containing 200 mL test solution in each of 4 replicates with 10 organisms/replicate. Test concentrations for the assay were 100%, 50%, 25%, 12.5%, and 6.25% effluent. Survival and dissolved oxygen were recorded daily in all replicates. Specific conductivity, salinity, temperature, and pH were measured daily in one replicate of each test treatment.

2.5 Data Analysis

When applicable, statistical analysis of acute exposure data was completed using CETIS, Comprehensive Environmental Toxicity Testing System, software. The program computes acute exposure endpoints based on EPA decision tree guidelines specified in individual test methods. If survival in the highest test concentration is >50%, the LC-50 is obtained by direct observation of the raw data.

2.6 Quality Control

As part of the laboratory quality control program, standard reference toxicant assays are completed on a regular basis for each test species. These results provide relative health and response data while allowing for comparison with historic data sets. See Table 2 for details.

3.0 RESULTS AND DISCUSSION

Results of the acute exposure bioassay completed using the inland silverside are summarized in Table 3. Effluent and dilution water characteristics are presented in Table 4. US EPA Region I toxicity test summary sheet can be found after the tables. Support data, including copies of the laboratory bench sheets, are included in Appendix A.

Minimum test acceptability criteria require ≥90% survival in the control concentrations. Achievement of these results indicate that healthy test organisms were used and that the dilution water had no significant adverse impact on the outcome of the assay. See the Executive Summary and Table 3 for test acceptability.

4.0 LITERATURE CITED

APHA. 1998. *Standard Methods for the Examination of Water and Wastewater*, 20th Edition. Washington D.C.

National Environmental Laboratory Accreditation Conference: Quality Systems. Chapter 5. June 2000.

US EPA. 2002. *Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms.* Fifth Edition. EPA-821-R-02-012.

US EPA. 2008. *Attachment G: NPDES Whole Effluent Toxicity Testing, Monitoring and Reporting Tips and Common Pitfalls.* US EPA Region I Offices, Boston, Massachusetts.

TABLE 1. Summary of Sample Collection Information.
Hull WWTF Effluent Biomonitoring Program. February 2011.

Sample Description	Type	Collection Date	Collection Time	Receipt Date	Receipt Time	Arrival Temp °C
Effluent	Comp	02/15-16/11	0730	02/16/11	1245	2
Receiving Water	Grab	02/16/11	0725	02/16/11	1245	2

TABLE 2. Summary of Reference Toxicant Data.
Hull WWTF Effluent Biomonitoring Program. February 2011.

Date	Endpoint		Value	Historic Mean/ Central Tendency	Acceptable Range	Reference Toxicant
M. beryllina						
1/26/11	Survival	LC-50 - 48 Hr	7.2	7.3	4.1 - 10.4	SDS (mg/L)

Means and Acceptable Ranges based on the most recent 20 reference toxicant assays

TABLE 3. Summary of Acute Evaluation Results.
Hull WWTF Effluent Biomonitoring Program. February 2011.

		Percent Survival							
Species	Exposure	Lab	RW	ST	6.25%	12.5%	25%	50%	100%
M. beryllina	48 hours	100%	100%	100%	100%	100%	100%	100%	100%

LC-50 and A-NOEC Results

Species	Exposure	Spearman-Karber	Probit	A-NOEC
M. beryllina	48 Hours	NC	NC	100%

COMMENTS:
RW - Receiving Water; used as diluent for assay
NC - The LC-50 value could not be computed by this method for this data set.
ST - Sodium thiosulfate adjusted laboratory control.

TABLE 4. Summary of Effluent and Diluent Characteristics. Hull WWTF Effluent Biomonitoring Program. February 2011.

PARAMETER	UNIT	EFFLUENT	RECEIVING WATER
Specific Conductivity - As Received	µmhos/cm	8620	47500
Specific Conductivity - Salinity Adjusted	µmhos/cm	39090	38450
pH - As Received	SU	7.20	7.66
pH - Salinity Adjusted	SU	7.69	7.71
Salinity - As Received	ppt	5	31
Salinity - Salinity Adjusted	ppt	25	24
Total Residual Chlorine	mg/L	0.536	<0.02
Total Solids	mg/L	5400	36000
Total Suspended Solids	mg/L	5	16
Ammonia as N	mg/L	13	<0.1
Total Organic Carbon	mg/L	5.8	<0.8
Aluminum, total	mg/L	0.021	0.054
Cadmium, total	mg/L	<0.0005	0.003
Chromium, total	mg/L	<0.002	<0.002
Copper, total	mg/L	0.011	0.007
Lead, total	mg/L	0.0006	0.0006
Nickel, total	mg/L	<0.002	<0.002
Zinc, total	mg/L	0.057	0.008

COMMENTS:

Additional water quality and analytical support chemistry data are available in Appendix A.

TOXICITY TEST SUMMARY SHEET

FACILITY NAME: Hull WWTF TEST START DATE: 02/17/11
NPDES PERMIT NO.: MA0101231 TEST END DATE: 02/19/11

TEST TYPE
_X_ Acute
___ Chronic
___ Modified Chronic (Reporting Acute Values)
___ 24 Hour Screen

TEST SPECIES
___ *Pimephales promelas*
___ *Ceriodaphnia dubia*
___ *Daphnia pulex*
___ *Americamysis bahia*
___ *Cyprinodon variegatus*
_X_ *Menidia beryllina*
___ *Arbacia punctulata*
___ *Champia parvula*
___ *Selenastrum capricornutum*

SAMPLE TYPE
___ Prechlorinated
___ Dechlorinated
___ Chlorine Spiked in Lab
_X_ Chlorinated on Site
___ Unchlorinated
___ No Detectable Chlorine Upon Receipt

SAMPLE METHOD
___ Grab
_X_ Composite
___ Flow-thru
___ Other

DILUTION WATER:

_X_ Receiving water collected at a point upstream or away from the discharge, free from toxicity or other sources of contamination; Receiving Water Name: Massachusetts Bay

___ Alternate surface water of known quality and hardness, to generally reflect the characteristics of the receiving water; Receiving Water Name: _____

___ Synthetic water prepared using either Millipore Milli-Q or equivalent deionized water and reagent grade chemicals; or deionized water combined with mineral water.

___ Artificial sea salts mixed with deionized water

___ Deionized water and hypersaline brine

___ Other

EFFLUENT SAMPLING DATES: 02/15-16/11 _____ _____ _____

EFFLUENT CONCENTRATIONS TESTED (%): 6.25; 12.5; 25.0; 50.0; 100

Permit Limit Concentration: ≥100 %

Was the effluent salinity adjusted? Yes If yes, to what level? 25 ppt

REFERENCE TOXICANT TEST DATE: 01/26/11 LC-50: 7.2 mg/L Sodium Dodecyl Sulfate

PERMIT LIMITS AND TEST RESULTS

Test Acceptability Criteria

Mean Control Survival: 100% _____

LIMITS		**RESULTS**	
LC-50:	≥100 %	LC-50	>100 %
		Upper Limit:	- %
A-NOEC:	- %	Lower Limit:	- %
		Method:	Direct Observation
C-NOEC:	- %	A-NOEC:	100 %
		C-NOEC:	- %
		LOEC:	-
IC- ___	- %	IC- _____	- %

APPENDIX A

DATA SHEETS

STATISTICAL SUPPORT

METHODS USED IN NPDES PERMIT BIOMONITORING TESTING

Parameter	Method
Acute Exposure Bioassays:	
Ceriodaphnia dubia, Daphnia pulex	EPA-821-R-02-012
Pimephales promelas	EPA-821-R-02-012
Americamysis bahia	EPA-821-R-02-012
Menidia beryllina, Cyprinodon variegatus	EPA-821-R-02-012
Chronic Exposure Bioassays:	
Ceriodaphnia dubia	EPA-821-R-02-013, 1002.0
Pimephales promelas	EPA-821-R-02-013, 1000.0
Cyprinodon variegatus	EPA-821-R-02-014, 1004.0
Menidia beryllina	EPA-821-R-02-014, 1006.0
Arbacia punctulata	EPA-821-R-02-014, 1008.0
Champia parvula	EPA-821-R-02-014, 1009.0
Trace Metals:	
ICP Metals	EPA 200.7/SW 6010 and EPA 200.8/SW 6020
Hardness	Standard Methods 20th Edition - Method 2340 B
Wet Chemistries:	
Alkalinity	EPA 310.2
Chlorine, Residual	Standard Methods 20th Edition - Method 4500CLD
Total Organic Carbon	Standard Methods 20th Edition - Method 5310C
Specific Conductance	Standard Methods 20th Edition - Method 2510B
Nitrogen - Ammonia	Standard Methods 20th Edition - Method 4500NH3G
pH	Standard Methods 20th Edition - Method 4500H+B
Solids, Total (TS)	Standard Methods 20th Edition - Method 2540B
Solids, Total Dissolved (TDS)	Standard Methods 20th Edition - Method 2540C
Solids, Total Suspended (TSS)	Standard Methods 20th Edition - Method 2540D
Dissolved Oxygen	Standard Methods 20th Edition - Method 4500-O G

ACUTE BIOASSAY DATA SUMMARY

STUDY: 20676		**"AS RECEIVED" EFFLUENT AND DILUENT CHEMISTRIES**							
CLIENT: United Water	**TEST ORGANISM:** *M. beryllina*		**TRC**	**TS/S**	**AMM**	**TOC**	**METALS**	**SAL**	**pH**	**S/C**
SAMPLE: Hull WWTF Effluent	**ORGANISM SUPPLIER/ BATCH / AGE:**	**EFF**	0.536 2002	005	004	003	002	4.8	7.20	8620
DILUENT: Receiving Water	*See Organism Culture Sheet*	**DIL**	<0.02	010	009	008	007	31.0	7.66	47500

SALINITY ADJUSTMENT RECORD : 4000 ~~5000~~ 4000 mL **ML EFFLUENT +** 93 mL RW + 5000 **G SEA SALTS =** ~~G Sea Salts~~ 4.2879 g **100% ACTUAL PERCENTAGE** ~~60%~~ actual percentage

CONC	REP	SURVIVAL			DO (mg/L)			pH (SU) (mL DI H2O)			TEMP (°C)			S/C (µmhos/cm)			SALINITY (ppt)		
		0	24	48	0	24	48	0	24	48	0	24	48	0	24	48	0	24	48
LAB	A	10	10	10	8.2	5.2	5.5	7.79	7.57	7.65	24	24	24	38760	40090	41300	25	25	26
	B	10	10	10	8.2	5.2	5.4												
	C	10	10	10	8.2	5.2	5.5												
	D	10	10	10	8.2	5.4	5.6												
Rec' Water	A	10	10	10	8.1	5.4	5.1	7.71	7.49	7.59	24	24	24	38850	39860	40980	24	25	26
	B	10	10	10	8.1	5.3	5.5												
	C	10	10	10	8.1	5.4	5.7												
	D	10	10	10	8.1	5.4	5.6												
6.25%	A	10	10	10	8.1	5.3	5.3	7.72	7.60	7.69	24	24	24	38700	39860	40780	25	26	26
	B	10	10	10	8.1	5.2	5.3												
	C	10	10	10	8.1	5.2	5.3												
	D	10	10	10	8.1	5.4	5.5												
12.5%	A	10	10	10	8.0	5.5	5.7	7.72	7.62	7.71	24	24	24	38760	39920	40820	25	26	26
	B	10	10	10	8.0	5.1	5.5												
	C	10	10	10	8.0	5.1	5.5												
	D	10	10	10	8.0	5.3	5.5												
DATE		2/17/11	2/18	2/19	2/17/11	2/18	2/19												
TIME		1400	1435	1330	1310	1410	1415												
INITIALS		DM	LB	CS	DM	LB	LB												

ACUTE BIOASSAY DATA SUMMARY

STUDY: 20676

CLIENT: United Water

TEST ORGANISM: *M. beryllina*

SAMPLE: Hull, MA WWTF

DILUENT: Receiving Water

"AS RECEIVED" EFFLUENT AND DILUENT CHEMISTRIES

	TRC	TS/S	AMM	TOC	ALK	HARD	SAL
EFF			See	Page	1		
DIL							

CONC	REP	SURVIVAL 0	SURVIVAL 24	SURVIVAL 48	DO (mg/L) 0	DO (mg/L) 24	DO (mg/L) 48	pH (SU) 0	pH (SU) 24	pH (SU) 48	TEMP (°C) 0	TEMP (°C) 24	TEMP (°C) 48	S/C (µmhos/cm) 0	S/C (µmhos/cm) 24	S/C (µmhos/cm) 48	SALINITY (ppt) 0	SALINITY (ppt) 24	SALINITY (ppt) 48
25%	A	10	10	10	7.9	5.0	5.6	7.72	7.67	7.74	24	24	24	38850	39950	40910	25	26	26
	B	10	10	10	7.9	5.0	5.7												
	C	10	10	10	7.9	5.2	5.6												
	D	10	10	10	7.9	5.2	5.5												
50%	A	10	10	10	7.9	4.6	5.5	7.71	7.73	7.80	24	24	24	38880	39930	40830	25	26	26
	B	10	10	10	7.9	4.9	5.2												
	C	10	10	10	7.9	4.5	4.8												
	D	10	10	10	7.9	4.7	4.9												
100%	A	10	10	10	8.0	4.7	4.6	7.69	7.85	7.90	24	24	24	39040	39970	40530	25	26	26
	B	10	10	10	8.0	4.3	4.4												
	C	10	10	10	8.0	4.3	4.5												
	D	10	10	10	8.0	4.8	4.9												
DATE		2/17/11	2/18	2/19	2/17/11	2/18	2/19												
TIME		1400	1435	1330	1310	1410	1415												
INITIALS		DM	LB	CS	DM	LB	LB												

Sodium Thiosulfate Lab Control

M. beryllina ACUTE BIOASSAY DATA SUMMARY

STUDY: 20676
CLIENT: Hull
SAMPLE: ~~C-5361~~ E0
DILUENT: LAB SALT

TEST ORGANISM: *M. beryllina*

Solution ID#: C-5361

CONC	REP	SURVIVAL			DISSOLVED OXYGEN			pH (SU)			TEMP (°C)			SALINITY (ppt)		
		0	24	48	0	24	48	0	24	48	0	24	48	0	24	48
Lab	A	10	10	10	7.0	4.6	4.8	7.88	7.53	7.64	24	24	24	25	26	25
	B	10	10	10	7.0	4.1	4.5									
	C	10	10	10	7.0	4.5	4.6									
	D	10	10	10	7.0	4.8	4.8									

39230 | 39940 | 40630 | S/C

Organism Wet Weights

Study: 20676

Client: Hull

Date/Time/Intials: 02/17/11 1500 DM

Start/End?: START

Rep	
1	0.01778
2	0.01118
3	0.00938
4	0.00714
5	0.01225
6	0.01454
7	0.01034
8	0.01168
9	0.01023
10	0.01112
11	0.01155
12	0.01039
13	0.00529
14	0.01114
15	0.00302
16	0.00417
17	0.00697
18	0.00643
19	0.00691
20	0.00863

Mean Weight (g):	0.0090715789
Test Volume (L):	0.2
Loading Rate(g/L):	0.4535789474

Aquatic Research Organisms

DATA SHEET

2-17-11
1130

I. Organism History

Species Menidia beryllina

Source: Lab reared ✓ Hatchery reared _____ Field collected _____

Hatch date 2-8-11 Receipt date _____

Lot number 020511MB Strain _____

Brood origination Cape Cod MA

II. Water Quality

Temperature 25 °C Salinity ≈30 ppt D.O. — ppm

pH 7.8 su Hardness — ppm Alkalinity — ppm

III. Culture Conditions

Freshwater _____ Saltwater ✓ Other _____

Recirculating ✓ Flow through _____ Static _____

DIET: Flake food ✓ Phytoplankton _____ Trout chow _____

Artemia ✓ Rotifers ✓ YCT _____ Other Encap. Shrimp Diet

Prophylactic treatments: _____

Comments: _____

_____

IV. Shipping Information

Client: EST # of Organisms 3207

Carrier: _____ Date shipped 2-17-11

Biologist: Mark Rosengard

PO BOX 1271 HAMPTON NH 03843-1271 (603) 926-1650 AROFISH@AOL.COM

RECORD OF METERS USED

STUDY: 20676	CLIENT: United Water - Hull, MA WWTF	
Exposure (Hours)		
	0	24	48
Water Quality Station #	1	1	1
Initials / Date	DM 2-17-21	LB 2/18	LB 2/19

Water Quality Station #1		Water Quality Station #2	
DO meter #	24	DO meter #	
DO probe #	89	DO probe #	
pH meter #	1097	pH meter #	
pH probe #	93	pH probe #	
S/C meter #	YSI 306	S/C meter #	
S/C probe #	"	S/C probe #	
Salinity meter #	"	Salinity meter #	

COMMENTS

PREPARATION OF DILUTIONS

Diluent: Receiving Water (RW)	Day: 0 Sample: 60,100	
Concentration %	Vol. Eff.(mls)	Final Vol.(mls)
Lab	0	800
RW	0	"
6.25%	50	
12.5%	100	
25%	200	
50%	400	
100%	800	"
INITIALS:	DM	
TIME:	1300	
DATE:	DM	

Report No: 20676 SDG:
Project: Hull

Sample ID: Effluent Start
Matrix: Water
Sampled: 02/16/11 0730

Parameter		Result	Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Total solids	20676-005	5400	10	mg/L	02/23/11 1233	02/26/11 1030	EAL/SM2540B
Total suspended solids	20676-005	5	2.5	mg/L	02/21/11 1020	02/24/11 1055	EAL/SM 2540D
Ammonia-N	20676-004	13	0.1	mg/L as N	02/22/11 1542	02/22/11 1542	JLH/SM 4500-NH3 G
Total organic carbon	20676-003	5.8	0.8	mg/L	02/17/11	02/18/11 1341	EAL/SM 5310 C
Aluminum, total	20676-002	0.021	0.02	mg/L	03/01/11 1000	03/01/11	JLH/EPA 200.8
Cadmium, total	20676-002	ND	0.0005	mg/L	03/01/11 1000	03/01/11	JLH/EPA 200.8
Calcium, total	20676-002	82	0.05	mg/L	03/01/11 1000	03/01/11	JLH/EPA 200.8
Chromium, total	20676-002	ND	0.002	mg/L	03/01/11 1000	03/01/11	JLH/EPA 200.8
Copper, total	20676-002	0.011	0.002	mg/L	03/01/11 1000	03/01/11	JLH/EPA 200.8
Lead, total	20676-002	0.0006	0.0005	mg/L	03/01/11 1000	03/01/11	JLH/EPA 200.8
Magnesium, total	20676-002	140	0.05	mg/L	03/01/11 1000	03/01/11	JLH/EPA 200.8
Nickel, total	20676-002	ND	0.002	mg/L	03/01/11 1000	03/01/11	JLH/EPA 200.8
Zinc, total	20676-002	0.057	0.002	mg/L	03/01/11 1000	03/01/11	JLH/EPA 200.8

Sample ID: Receiving Water Start
Matrix: Water
Sampled: 02/16/11 0725

Parameter		Result	Quant Limit	Units	Date Prepared	Date of Analysis	INIT/Method/Reference
Total solids	20676-010	36000	50	mg/L	02/23/11 1233	02/26/11 1030	EAL/SM2540B
Total suspended solids	20676-010	16	2.5	mg/L	02/21/11 1020	02/24/11 1055	EAL/SM 2540D
Ammonia-N	20676-009	ND	0.1	mg/L as N	02/22/11 1543	02/22/11 1543	JLH/SM 4500-NH3 G
Total organic carbon	20676-008	ND	0.8	mg/L	02/17/11	02/18/11 1341	EAL/SM 5310 C
Aluminum, total	20676-007	0.054	0.02	mg/L	03/01/11 1000	03/01/11	JLH/EPA 200.8
Cadmium, total	20676-007	0.003	0.0007	mg/L	03/01/11 1000	03/01/11	JLH/EPA 200.8
Calcium, total	20676-007	340	0.3	mg/L	03/01/11 1000	03/01/11	JLH/EPA 200.8
Chromium, total	20676-007	ND	0.002	mg/L	03/01/11 1000	03/01/11	JLH/EPA 200.8
Copper, total	20676-007	0.007	0.002	mg/L	03/01/11 1000	03/01/11	JLH/EPA 200.8
Lead, total	20676-007	0.0006	0.0005	mg/L	03/01/11 1000	03/01/11	JLH/EPA 200.8
Magnesium, total	20676-007	960	0.07	mg/L	03/01/11 1000	03/01/11	JLH/EPA 200.8
Nickel, total	20676-007	ND	0.002	mg/L	03/01/11 1000	03/01/11	JLH/EPA 200.8
Zinc, total	20676-007	0.008	0.002	mg/L	03/01/11 1000	03/01/11	JLH/EPA 200.8

Notes:

ND = Not Detected

EnviroSystems, Inc. P.O. Box 778 Hampton, NH 03842-0778 603-926-3345 fax 603-926-3521 www.envirosystems.com

ESI

SAMPLE RECEIPT AND CONDITION DOCUMENTATION

STUDY NO:	20676		
SDG No:	Hull		
Project:	Hull		
Delivered via:	**ESI**		
Date and Time Received:	02/16/11 1245	Date and TIme Logged into Lab:	02/16/11 1650
Recieved By:	WB	Logged into Lab by:	JTP
Air bill / Way bill:	No	Air bill included in folder if received?	NA
Cooler on ice/packs:	Yes	Custody Seals present?	NA
Cooler Blank Temp (C) at arrival:	2	Custody Seals intact?	NA
Number of COC Pages:	1		
COC Serial Number(s):	A1006958		
COC Complete:	Yes	Does the info on the COC match the samples?	Yes
Sampled Date:	Yes	Were samples received within holding time?	Yes
Field ID complete:	Yes	Were all samples properly labeled?	Yes
Sampled Time:	Yes	Were proper sample containers used?	Yes
Analysis request:	Yes	Were samples received intact? (none broken or leaking)	Yes
COC Signed and dated:	Yes	Were sample volumes sufficient for requested analysis?	Yes
Were all samples received?	Yes	Were VOC vials free of headspace?	NA
Client notification/authorization:	Not required		

Field ID	Lab ID	Mx	Analysis Requested	Bottle	Req'd Pres'n	Verified Pres'n
Effluent Start	20676-001	W	MB48AD StartSample	1x3750 P	4 C	Yes
Effluent Start	20676-002	W	Total Metals Cd,Cr,Ni,Pb,Cu,Zn,Al,Ca,Mg;	250 P	HNO3	Yes
Effluent Start	20676-003	W	TOC	1x40 G	H2SO4	Yes
Effluent Start	20676-004	W	NH3;	125 P	H2SO4	Yes
Effluent Start	20676-005	W	TS,TSS	500 P	4 C	Yes
Receiving Water Start	20676-006	W	MB48AD StartDiluent	2x3750 P	4 C	Yes
Receiving Water Start	20676-007	W	Total Metals Cd,Cr,Ni,Pb,Cu,Zn,Al,Ca,Mg;	250 P	HNO3	Yes
Receiving Water Start	20676-008	W	TOC	1x40 G	H2SO4	Yes
Receiving Water Start	20676-009	W	NH3;	125 P	H2SO4	Yes
Receiving Water Start	20676-010	W	TS,TSS	500 P	4 C	Yes

Notes and qualifications:

See C.O.C.

ESI EnviroSystems, Inc.
1 Lafayette Road
Hampton, NH 03842

Voice: 603-926-3345
FAX: 603-926-3521

ESI Job No: 20676

CHAIN OF CUSTODY DOCUMENTATION

Client:	United Water - Hull	Contact: Peter Nyberg		Project Name: United Water - Hull WWTF	
Report to:	Peter Nyberg	Address: 1111 Nantasket Avenue		Project Number: P0036	Task: 0001
Invoice to:	Peter Nyberg	Address: Hull, MA 02045		Project Manager: Peter Nyberg	
Voice:	781-925-0906	Fax: 781-925-3056		email: peter.nyberg@unitedwater.com	P.O.No: ' Quote No:41181

Protocol: NPDES

Lab Number (assigned by lab)	Your Field ID: (must agree with container)	Date Sampled	Time Sampled	Sampled By	Grab or composite (G/C)	Container No	Container Size (mL)	Container Type (P/G/T)	Field Preservation	Matrix S=Solid W=Water	Filter N=Not needed F=Done in field L=Lab to do	Analyses Requested\ Special Instructions:
001	Effluent Start	15/16/11	7:30	DJC/SB	C	1	3750	P	4 C	Water	N	MB48AD StartSample
002	Effluent Start	15/16/11	7:30	ABR/JR	C	1	250	P	HNO3	Water	N	Total Metals Cd,Cr,Ni,Pb,Cu,Zn,Al,Ca,Mg;
003	Effluent Start	15/16/11	7:30	DJC/SB	C	1	40	G	H2SO4	Water	N	TOC
004	Effluent Start	15/16/11	7:30	ABR/BB	C	1	125	P	H2SO4	Water	N	NH3;
005	Effluent Start	15/16/11	7:30	DJC/BB	C	1	500	P	4 C	Water	N	TS,TSS
006	Receiving Water Start	16/11	7:25	DJC/BB	G	2	3750	P	4 C	Water	N	MB48AD StartDiluent
007	Receiving Water Start	16/11	7:25	DJC/BB	G	1	250	P	HNO3	Water	N	Total Metals Cd,Cr,Ni,Pb,Cu,Zn,Al,Ca,Mg;
008	Receiving Water Start	16/11	7:25	DJC/BB	G	1	40	G	H2SO4	Water	N	TOC
009	Receiving Water Start	16/11	7:25	DJC/BB	G	1	125	P	H2SO4	Water	N	NH3;
010	Receiving Water Start	16/11	7:25	DJC/BB	G	1	500	P	4 C	Water	N	TS,TSS

Relinquished By: Daniel C. Colon	Date: 2/16/11 Time: 1245	Received By: G/Bonny	Date: 2/16/11 Time: 1245
Relinquished By:	Date: Time:	Received at Lab By:	Date: Time:

Comments:

ERR

COC Number: A1006958

Sample Delivery Group No: Febuary 2011

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